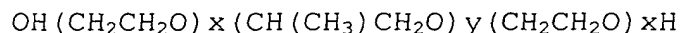


ABSTRACT

An object of the present invention is to provide a method for forming a porous silica film having mechanical strength.

5 Using a surfactant, one or more kinds of nonionic surfactant(s) having a 0.1 weight % concentration according to the Du Nouy method expression and a surface tension of 45 mN/m or larger at 25°C is (are) used as a surfactant, a mixed solution obtained by mixing this nonionic surfactant, a
10 hydrolyzable alkoxysilane compound, water and an alcohol is coated on the substrate, and the surfactant in this mixed solution is decomposed or burned out to form a porous silica film. Upon this, the surfactant is suitably represented by a rational formula [Chemical formula 1]. Alternatively, a
15 solution in which a dimethyldialkoxysilane compound is further added to the mixed solution may be used.



. . . [Chemical formula 1]

(In a rational formula [Chemical formula 1], x and y denote an
20 integer satisfying $1 \leq x \leq 185$ and $5 \leq y \leq 70$, respectively.)